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APPLICATION NO.	FILED DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,088	10/21/2003	Harald Kaspar	58136US004	4837
32692	7590	06/17/2004	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY			HU, HENRY S	
PO BOX 33427			ART UNIT	PAPER NUMBER
ST. PAUL, MN 55133-3427			1713	

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/690,088	KASPAR ET AL.
	Examiner	Art Unit
	Henry S. Hu	1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-14 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5-3-04, 1-22-04.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

(a) On page 9 at lines 19 and 20, both recitations of “hydro peroxide” are improper and should be changed to “**hydroperoxide**” without using a space in-between according to traditional wording. Please refer to Aldrich chemical catalog for correct name.

(b) On page 9 at line 12, recitation of “thiosulfates” may be wrong. It may be changed to “**thiosulfites**” since only **sulfite-related reducing agents** are involved on lines 11-12.

(c) On page 16 at line 18, page 17 at line 12 and page 18 at line 31, all recitations of “**vinyldenedifluoride**” are improper and should be changed to “**vinyldenefluoride**” since it relates to monomer VDF. Please refer to Claim 8 at line 2 for a correct name. Otherwise, one having ordinary skill in the art may confuse it.

Appropriate corrections for (a) - (c) are required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

On **Claim 11 at line 2**, the term "substantially" is a relative term, which renders the claim **indefinite**. The term "substantially" is not defined by the claim or any dependent claim for the low and high limit, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. See MPEP § 2173.05(b). It is noted that the other term "substantially" used in Claims 1 at line 2 has been well defined on page 2, line 26 – page 3, line 9.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. *The limitation of parent Claim 1 of the present invention relates to process of making a copolymer of fluorinated olefin and hydrocarbon olefin selected from ethylene, propylene and mixtures thereof, the process comprising a substantially emulsifier free aqueous emulsion polymerization of said fluorinated olefin and said hydrocarbon olefin and wherein said process comprises copolymerization of said fluorinated olefin and hydrocarbon olefin in the presence of fluoropolymer particles and/or in the presence of fluorinated liquid that is in a form suitable for improving the copolymerization of said fluorinated olefin and hydrocarbon olefin. See other limitations of dependent Claims 2-14.*

5. Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Saito et al. (US 6,716,942 B1).

Regarding the limitation of parent **Claim 1**, Saito et al. disclose that various types of fluorinated copolymers such as **tetrafluoroethylene (TFE) with propylene** can be prepared through emulsion polymerization process (column 3, line 61 –column 4, line 11; column 1, line 17-41; column 10, line 19-32; column 6, line 1-32; column 3, line 61 – column 5, line 63). Saito et al. further disclose **an inactive fluorocarbon can be presented** in the reaction field with the polymerizable fluorinated monomer in order to obtain a higher molecular weight since the produced polymer does not dissolve in the reaction system “completely” and is in a dispersed state. It can be tetrafluoroethane or trifluoroethane specifically (column 6, line 33-36; column 3, line 65-67; column 2, line 53-60). Saito et al. furthermore disclose that the polymerization can be carried out by any of batchwise, semi-batchwise and continuous methods,

and initially can put one fluorinated monomer with above-mentioned inactive fluorocarbons into critical pressure and temperature for polymerization. Therefore, the polymerization process reads on the presence of both fluorinated particle and fluorinated liquid. With respect to emulsifier-free emulsion polymerization, Saito et al. have disclosed emulsifier or surfactant is not required in such emulsion or suspension polymerization (column 1, line 17-54; and see working examples).

6. Regarding **Claim 6**, inactive fluorinated liquids are delivered into the reactor by conventional way used in order to obtain critical state (see working examples).

Regarding **Claim 10**, fluorinated vinyl ethers are included (column 4, line 10-27).

Regarding **Claim 11**, some of the copolymers obtained from Saito certainly carry the claimed melting point and are substantially amorphous.

Regarding **Claims 12 and 13**, examples of the radical polymerization initiators are organic or inorganic peroxide, persulfate, azo compound, and the like; they are conventionally used in the art and are thermally initiated (column 8, line 43 – column 9, line 39).

Regarding **Claim 14**, one example of copolymers is from **tetrafluoroethylene (TFE) and propylene** and can be prepared in the mole ratio of 1 to 99/1 to 99 (column 6, line 17-18).

Remaining dependent **Claims 2-5 and 7-9** are thereby rejected with the above rejection for Claims 1, 6 and 10-14.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over McCarthy et al. (US 5,955,556) in view of Saito et al. (US 6,716,942 B1).

Regarding the limitation of parent **Claim 1**, McCarthy et al. disclose the preparation of a stable aqueous self-dispersible fluorinated copolymer dispersion of up to 48% polymer solids in water in the absence of surfactant due to improved conversion rate of monomer to polymer

(abstract, line 1-11). McCarthy et al. further disclose during polymerization process, fluoropolymer macromolecules are produced having inorganic, **“surfactant-like” functional end groups** which impart excellent latex stability to the polymer even these end groups are present in very low concentration (column 6, line 61-65). McCarthy et al. furthermore disclose that copolymers can be made from **combination of fluorolefin(s) and nonfluorolefin(s)** (column 3, line 49 – column 4, line 10).

The McCarthy reference is silent about using the presence of fluorinated liquids in the polymerization. Saito et al. teach that **an inactive fluorocarbon such as tetrafluoroethane or trifluoroethane can be presented** in the reaction field with the polymerizable fluorinated monomer in order to obtain a higher molecular weight **since the produced polymer does not dissolve in the reaction system “completely” and is in a “dispersed state”** due to diluting effect (column 6, line 33-36; column 3, line 65-67; column 2, line 53-60).

9. In light of the fact that copolymers produced by Saito and McCarthy are containing **the same type of monomers, which can be obtained through emulsion polymerization.** Therefore, one having ordinary skill in the art would have found it obvious to **modify McCarthy’s emulsion polymerization process by adding the saturated hydrofluorinated compounds such as tetrafluoroethane or trifluoroethane as taught by Saito.** One would expect one advantage is that obtaining a higher molecular weight on the final product **since the produced polymer being in the presence of such inactive compounds it does not dissolve in the reaction system “completely” and is in a “dispersed state” due to diluting effect.**

Regarding **Claims 2-14**, the rejection of 102(e) over Saito set forth above for Claims 1-14 is incorporated here by reference. Remaining dependent **Claims 2-14** are thereby rejected with the above rejection.

10. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oxenrider et al. (US 5,453,477) in view of Saito et al. (US 6,716,942 B1).

Regarding the limitation of parent **Claim 1**, Oxenrider et al. disclose preparation of stable aqueous fluorinated copolymer dispersion in the absence of soaps or surfactants due to improved wettability of polymer particles (abstract, line 1-12; column 3, line 18-23; column 16, line 18-31). Oxenrider et al. further disclose that copolymers can be made from **combination of fluoroolefin(s) and nonfluoroolefin(s)** (column 3, line 59 – column 4, line 5; column 7, line 42-57).

The Oxenrider reference is silent about using fluorinated liquids. Saito et al. teach that **an inactive fluorocarbon such as tetrafluoroethane or trifluoroethane can be presented in the reaction field with the polymerizable fluorinated monomer in order to obtain a higher molecular weight since the produced polymer does not dissolve in the reaction system “completely” and is in a “dispersed state” due to diluting effect (column 6, line 33-36; column 3, line 65-67; column 2, line 53-60).**

11. In light of the fact that copolymers produced by Saito and Oxenrider are containing the same type of monomers, which can be obtained through emulsion polymerization. Therefore, one having ordinary skill in the art would have found it obvious to **modify Oxenrider's emulsion polymerization process by adding the saturated hydrofluorinated compounds such as tetrafluoroethane or trifluoroethane as taught by Saito.** One would expect one advantage is that obtaining a higher molecular weight on the final product since the produced polymer being in the presence of such inactive compounds it does not dissolve in the reaction system "completely" and is in a "dispersed state" due to diluting effect.

Regarding **Claims 2-14**, the rejection of 102(e) over Saito set forth above for Claims 1-14 is incorporated here by reference. Remaining dependent **Claims 2-14** are thereby rejected with the above rejection.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to process of making a copolymer of fluorinated olefin and hydrocarbon olefin with substantially emulsifier free aqueous emulsion polymerization and in the presence of fluoropolymer particles and/or fluorinated liquid:

US Patent No. 6,429,258 to Morgan et al. only disclose that the aqueous dispersion polymerization process to prepare PTFE or its copolymers can be processed in the presence of a

combination of fluorosurfactants with one of which is PFPE carboxylic acid or salt (abstract, line 1-3; column 11, line 25-50), as well as **some organic compound such as 1,1,2-trichloro-1,2,2-trifluoroethane (R-113)** (column 3, line 10-15). No claimed process is disclosed.

US Patent No. 3,345,317 to Hoashi discloses that the aqueous dispersion polymerization process to prepare PTFE or its copolymers can be processed and stabilized with the presence of some organic compound such as **trifluorotrichloroethane, particularly 1,1,2-trifluoro-1,2,2-trichloroethane** (column 2, line 32-34; column 3, line 36-37). No claimed process is disclosed.

13. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is (571) 272-1103. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <<http://pair-direct.uspto.gov>>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

June 14, 2004

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